The Status and Analysis of the Research on Children's Science Education Aged from 3 to 6 in China

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Abstract

The content analysis is used to analyze the total 273 articles about children's science education research from 2000-2012 in CNKI (China National Knowledge Infrastructure). Analysis dimensions include quantity, content, author and research methods. Analysis results show that the number of children's science education literature has a trend of rising year by year. The study of children's science education mainly concentrates in the east area. There are more researchers in colleges and kindergartens, and research methods are given priority to individual speculative method.

Keywords: science education; Children's science education; content analysis

1. The Research Purpose

The Guidelines (try out) for Kindergarten Education formulated by the Chinese Ministry of Education points out that kindergarten education content can be relatively divided into five areas—health, language, society, science and art. The content in the field can integrate with each other and promote the development of children's emotion, attitude, ability, knowledge and skills from different angles. Among the five areas above, science education area is weak with less research achievements. The development of science area is slow compared with the other four areas. The study uses content analysis method to do quantitative research on Chinese 3-6 year-old children's science education so as to study the characteristics and trends of its development.

2. The Research Method and Process

2.1 The Research Method

Content analysis is a method of examining social reality. Through systematically analyzing the dominant characteristics of literature content, the researchers will get the related references from potential content. Thus it is a kind of objective, systematic and quantitative method for communication content with obvious characteristics. It is based on the quantitative analysis of the existing data, and aims to reveal the unknown behaviors, attitudes and values hidden behind the obvious contents, with combining the qualitative and quantitative research.

2.2 The Object of Study

“Kindergarten”“infants”“children”“science”“science education" are used as keywords to carry out senior retrieval in CNKI, finding out total 326 articles about3 to 6 year-old children's science education from 2000 to 2012. 273 effective articles are taken as the research object. CNKI is China's largest network resource database, containing relatively complete literature and higher credibility. Through the statistical analysis on the science education literature in past 12 years, the characteristics and trends of Chinese science education development will be found.

2.3 Analysis Dimensions

According to the research purpose and statistical analysis on 273 articles of infant science education from 2000 to 2012, the primary analysis dimensions are divided into four parts: the annual number of literature, research contents, the authors and the research methods. The number of articles in each year will show the development trend of science education. The research content will reveal the focus and insufficiency of science education. The author dimension will show the distribution status of science education research and the method part will reveal the scientificity of the past science education.

2.3.1Research Content Dimensions are divided Into Two Secondary Dimensions as Follows

(1) Children's science education in family which refers to the related research on family science education for 3-6 year-old children.

Operational definitions: articles with such words as "home school joint together, family enlightenment education" in the title are included into family education dimension.

(2) Children's science education in school which refers to the science education implemented in the kindergarten.

A. Study on science curriculum

Operational definition: articles with such words as " curriculum design, curriculum content, curriculum implementation, curriculum evaluation, curriculum objectives, curriculum case studies, classroom observation, environment creation, course materials, regional activities, effective questions, picture book reading " etc. will be classified into this dimension. For example "The Exploration of Science Laboratory Activity in Kindergarten" belongs to this dimension.

B. Research on children's development and cultivation in science education

This dimension includes children's cognitive development, children's social development, the development of children's creativity, children's observation, children, children's emotional development exploration ability training, child development, children's subjective initiative development, children's interest in training, children's scientific quality education, children's scientific concept to obtain, child development, children's life, children's action and behavior, children's intellectual development, children's potential development, as well as other related words in the title can all be included into this dimension.

C. Development and education of teachers in science education

Operational definition: the article with words of" role definition, pre-service education, relations between teachers and students, teachers' notion and behaviors related to teachers" belong to this dimension.

(3) Comprehensive research

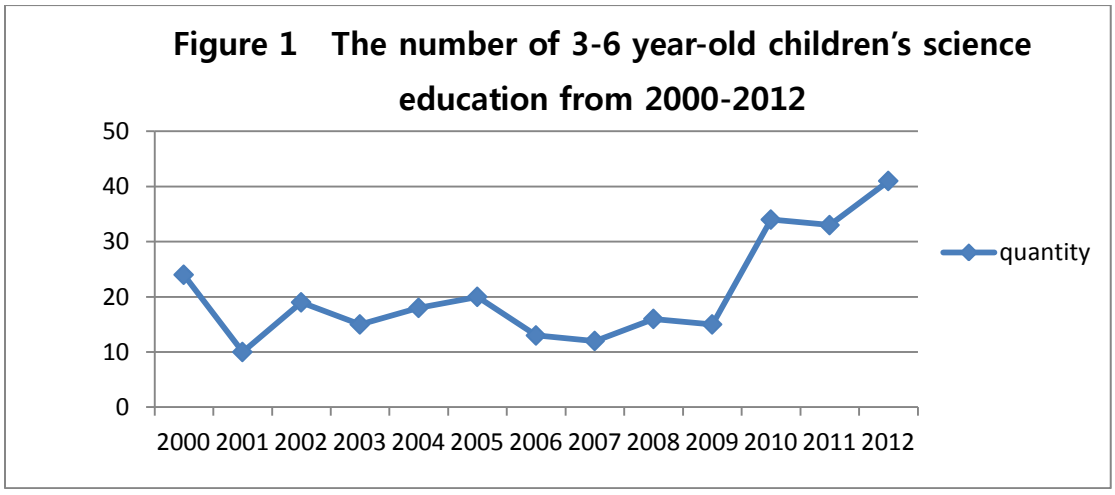
Comprehensive research cannot be involved into other dimensions. So this part is studied alone as a separate dimension, which features the words "review, methods, strategies, policies and regulations, disciplinary fusion, investigation and analysis, forecast, the difference of Chinese and foreign research".

2.3.2 Author dimension: including the regional information (including the eastern, central and western) and authors' institutions (including colleges and universities, education research institutes, kindergartens and other units).

2.3.3 Methods dimension: including literature method, experience method, individual speculative method, observation method, discovery method, questionnaire survey method, experimental method, interview method, comparative study, case study.

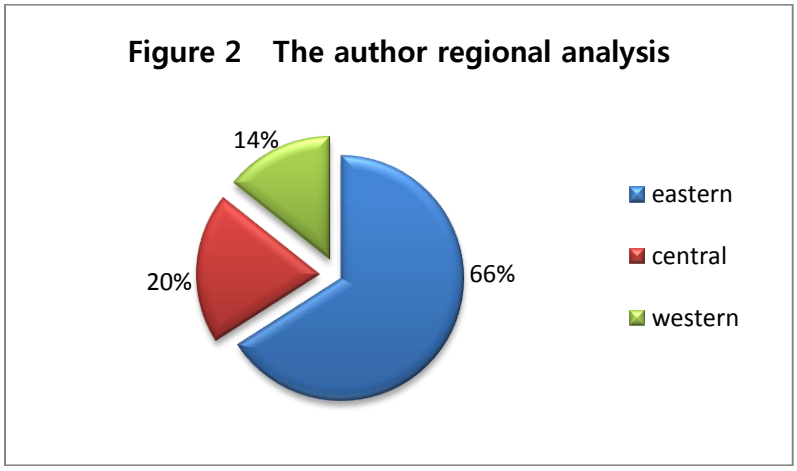
2.4 Data Statistical Analysis

2.4.1 Literature Quantitative Analysis



It can be seen from Figure 1 that from 2000 to 2009, the literature quantity change is not distinct. However, from 2010 to 2012, there is a sharp rise in the number of science education literature. We can find that although 3-6 years old children's science education research in China has not drawn enough attention at the beginning of 21 century, there is a rapid growth of the number from 2010 with more and more research achievements. There may be two reasons for this phenomenon. First of all, on July 29, 2010, the Chinese government officially released the education planning outline, in which the third chapter discussed the deployment of preschool education work. It is the first time in Chinese medium and long-term education program at the national level, which highlights the emphasis and strong determination of the country on promoting the development of preschool education. The guiding role of the government has promoted the development of the preschool education research in all aspects, and more attention are paid on the research. In fact, the national science and technology meeting was held in Beijing as early as March in 1978. As Deng Xiaoping's thesis of "Science and technology is productivity" was proposed, Chinese science education has drawn scholars' attention. However, compared with other research in education, science education is the weakest, especially for the 3-6 year-old children. Second, as the introduction of foreign scientific education thoughts and various books on science and education, teaching material and experiment, Chinese scholars also pay their attention to the blank area of children's science education.

2.4.2 The Author Region and Institutions Analysis



According to Figure 2, we can see that the number of scholars in the west area studying on children's science education is the least. Then is the middle area and the east area is the most. The difference between the west and the east is distinct. Analysis of the reasons: first, eastern China is the most economically developed region, and China's early childhood science education also started in the east. Besides, there are more sufficient funds, more advanced education theory and more research objects for the east researchers. So the researcher number is larger. Second, most of China's colleges and universities gathered in the eastern region. The universities which are prominent in this field are more than those in the west. Third, there are more foreign exchange opportunities in eastern China, which provide the researchers more chances to contact with other countries scholars and learn new theory and research achievements.

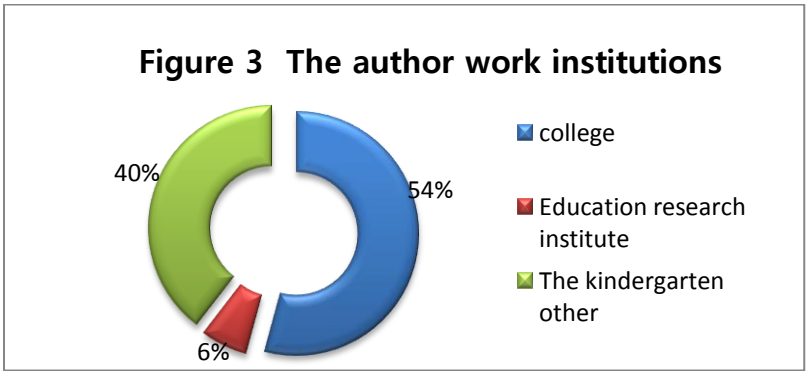


Figure 3 shows that 54% authors of articles selected from CNKI are from all kinds of universities and colleges, 40% are from the kindergartens and other social institutions (such as press) and the rest 6% of the authors are from the education research institutions (e.g. education research institute).

This shows that scholars from the universities make the biggest contribution for children's science education research. The second is the research from the kindergarten teachers, and the difference between the two groups is not distinct. The research from the education association is the least. Analysis of reasons: first, researchers at the universities and colleges have stronger scientific research ability, good study atmosphere and more education concepts. There are more advantages for them. Second, most researchers in kindergarten is a front-line teachers. They have rich experience in practice, but less theoretical knowledge, and most of them have not learnt how to do research systematically, so their articles tend to base on practical experience lacking strong theory. As the kindergartens are getting more and more support in the respect of fund and expert, and the teachers are getting more opportunities of further study, the research initiative of kindergarten teachers are greatly raised, which help increase the research number. Third, China's education research institutions are mostly open for the entire education circle, children's science education research is just a part of their research. Without enough attention, the lack of achievement is inevitable.

2.4.3 Research Content Analysis

Through the analysis of the literature content, it is found that there are only three articles about the family science education research, accounting to 1 percent of the total. The number of research on children's science education in kindergarten are 169, accounting to 62 percent, and the comprehensive study number is 99, accounting to 37 percent. It is visible that children's science education research content is focused on the preschool children's science education area, far more than the area of family and comprehensive research. The reason may be that most researchers are college scholars and kindergarten teachers, researchers in the kindergarten is more convenient to implement, so more articles are the study of children's science education in kindergarten. Children science education research should go deep among the family, and parents need to cooperate. It is difficult to do the research. So the research content of the article is very few. Comprehensive study of the author most is the scholar in university. This part of the people, strong scientific research ability of good at to do comprehensive research, but the comprehensive research is so complicated that there are less scholars studying in this area.

In school science education research, the curriculum-related research accounts for 50 percent of the total; the research on students accounts for 39 percent; only 11 percent are related to teachers. Thus it can be seen that children's science education research is the focus of the course, but the study of teacher development is lacking. The reason may be that 3-6 years old children's science research can get reference from the curriculum research of other ages, and taking advantage of the achievements in its own area. Thus the method can be promoted, innovations can be found, and the research content can be enriched. Besides, the courses for children aged from 3 to 6 are more various and flexible than the other education stages, providing more chances of innovations. And the teachers in preschool will be more easily get involved into different research activities. On the contrary, studying the teacher education and development seems to be more difficult for grassroots teachers. Besides, the experts and scholars specializing the teacher education and development in the field of children's science education aged from 3 to 6 are rare. Thus there is a lack of energy for the study in the area of teacher education and development. Although the student-related research number is less than that of curriculum-related research, but as the child-centered concept of students continues to deepen in China, the scholars in the field of student-related research is sure to increase gradually.

2.4.4 Research Methods Analysis

In the process of research, the author found that children's science education research mainly uses ten methods: the literature method, summary of experience method, individual speculative method, observation method, discovery method, questionnaire survey method, experimental method, interview method, comparative study and case study. The individual speculative method is the mostly used making up 52% of the total; the second is the summary of experience method, accounting for 25% of the total. The proportion of the rest methods is all less than 7 percent. Through the data, we can see that speculative method and summary of experience method in the study of children's science education is the main research methods, and other research methods used rarely. There may be three reasons. First, many researchers tend to do the speculation on the basis of practice, and even without the practical research before writing an article. Thus, the achievements do not have practical meanings. Second, Chinese children's science education research is just starting up, the researchers in this field are mostly the preschool teachers without a strong scientific research ability. The operation of other research methods requires better research ability for the researchers. However, most preschool teachers in China do not have enough education background, it is difficult for them to handle different research methods.

Third, the evaluation system is not standard and reasonable enough. The number of published articles is usually used as an important standard for a good teacher. Individual speculative method can get results more easily with less time than other methods. Thus, the researchers are reluctant to spend a long time for a practice research. This kind of research method is not only widely used in the field of children's science education, but also widely used in the other fields of education.

3. Conclusion

The analysis of 273 articles about children's science education research from 2000-2012 in CNKI shows that the slow development of Chinese children's science education research is slow, but getting more and more attention gradually in recent years. Several suggestions are put forward as follows in order to promote the development of Chinese children's science education.

(1) Emphasize the teacher education and development in the field of children's science education.

In China, the preschool teachers education level is generally low, and needs to improve the quality of teachers, many teachers are not professionally trained. The development and training of preschool teachers should be strengthened and the ability of teachers' scientific research should be improved, so as to improve the level of children's science education and promote the development of children. At the meantime, the standards for recruiting kindergarten teachers should also be increased to ensure high quality of preschool teachers. The improvement of the quality of teachers is the key to improve the level of children's science education research.

(2) Emphasize the family science education for children.

There are many single-child families in China, and many parents are so busy with their work that they ignore the enough care for children. The parents do not know the correct education method, especially the science education. Besides, there are few institutions dedicated to family education training. As a result, parents cannot carry out proper education in family for lacking appropriate education views. Without correct guidance, the children's interest in science will not develop healthily. Thus, to strengthen the research on science education in family and enhance the cooperation between school and family will be an effective way for science education.

(3) Pay attention to the development of children's science education in the west area.

In central and western China education level is relatively backward, this phenomenon is more prominent in kindergarten stage. So we are asking for the government and relevant scholars pay more attention to the development of the central and western children's science education and research. More education funds should be provided and more study should be encouraged to improve the current situation of the central and western children's science education.

(4) Change the evaluation system of researchers and encourage various methods.

The number of published articles is the main standard for a researcher which leads to the low level of research achievements. Many researchers in China tend to use the individual speculative method so as to publish as many articles as possible in a short time. This kind research often divorce from the reality which is bad for development of children's science education. Thus, we must change the evaluation standard for researchers and encourage them to do some real study which is helpful for practice by using different methods. Second, encourage the researchers to do more creative work, learn from other subjects and put into use. Last but not least, show respect for the researchers' study interest so as to avoid the research for research problems.

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